



Bell Atlantic For Your Business

Infospeed DSL

[Infospeed DSL
Homepage](#)[What is
Infospeed DSL?](#)[Availability](#)[Pricing](#)[Frequently
Asked Questions](#)[Press Releases
and Links](#)[Infospeed DSL for
Service Providers](#)[Quick Find](#)[Contact Us](#)

Talk and Surf Simultaneously

Infospeed DSL eliminates the need to dial up, sign on and wait for downloads. Plus, Infospeed DSL means your phone lines are not only faster, they're more flexible. You can tap into the Internet or a remote LAN without having to disconnect every time you need to make a call or use the fax. You can even download a critical file from a remote source while you're on a conference call.

Infospeed DSL can simplify your life as it strengthens your business.

- *You expand the capabilities of your existing phone line*, which makes Internet and remote LAN access more convenient. Use your telephone or fax while you're on the Web or connected to the office. No need to sign off as with traditional modems.
- *Your connection is always on*. This means no dial-ups, no busy signals, and no connection errors. And, with no usage fees, it is efficient too.

[The Benefits
of Speed](#)[Works on Existing
Phone Lines](#)[Fast and Sure](#)[Keep You
Connected](#)[Homepage](#) [For Your Home](#) [For Your Business](#) [For Government](#) [About Us](#) [Privacy](#)



Bell Atlantic For Your Business

Infospeed DSLInfospeed DSL
HomepageWhat is
Infospeed DSL?

Availability

Pricing

Frequently
Asked QuestionsPress Releases
and LinksInfospeed DSL for
Service Providers

Quick Find

Contact Us

Keeps You Connected

With ADSL technology, Bell Atlantic turns your existing phone line into a constant high-speed data connection, while allowing you to continue to use your phone or fax line as usual. Because Infospeed DSL gives you automatic access to your ISP or corporate LAN, you will never have to dial up, which means you won't have to deal with the hassles of busy signals and connection errors.

The Benefits
of SpeedWorks on Existing
Phone LinesFast and Safe
Connectivity

As you can see below, this dedicated connection serves as a powerful tool for accessing data from your office or home office.

Internet/Online

Bell Atlantic's Infospeed DSL service sends data at rates ranging from 640 Kbps up to 7.1 Mbps from the Internet to your home. Depending on the package you choose, your access speed will be from 22 to 246 times faster than that of a conventional 28.8 Kbps modem, making Internet navigation more practical and reliable. The greatly increased speeds of Infospeed DSL turn your PC into a powerful resource. Use it to experience the benefits of enhanced multimedia content, or, simply, to get the information you need quickly and efficiently.

Remote LAN Access/Teleworking

As the teleworking trend continues to gain momentum, people are looking for a more powerful way to connect to the office from home. Infospeed DSL is an ideal — and affordable — solution that lets teleworkers function just like they're in the office, but without the headaches of commuting. All it takes is Infospeed DSL service at home and DSL facilities at the office. To establish these facilities, the office can set itself up as a direct Service Provider, or simply support telecommuting via the Internet. Either way, the bandwidth provided by Infospeed DSL eliminates a key disadvantage of teleworking: slow download time. For instance, Infospeed DSL can cut the time required to transmit a typical Windows screen (50kb) from 21 seconds down to just a fraction of a second. This powerful service gives teleworkers a faster-than-ever link with activities, information, and resources back at the office.

Distance Learning

With Infospeed DSL, faculty and students don't have to be on campus to tap into the university



have to be on campus to tap into the university LAN. They can access databases, messaging systems, and take advantage of interactive, computer-based learning opportunities.

Telemedicine

With Infospeed DSL at home or in the office, a physician has high-speed access to patient records that may be stored in a hospital or other remote-location LAN. Infospeed DSL's capacity to handle large data transfers efficiently and accurately means that even complex files can be exchanged.



[Homepage](#) [For Your Home](#) [For Your Business](#) [For Government](#) [About Us](#) [Privacy](#)

Copyright © 1998 Bell Atlantic Corporation



Bell Atlantic For Your Business

Infospeed DSL

Infospeed DSL
HomepageWhat is
Infospeed DSL?

Availability

Pricing

Frequently
Asked QuestionsPress Releases
and LinksInfospeed DSL for
Service Providers

Quick Find

Contact Us

Infospeed DSL Pricing

Infospeed DSL Packages

Infospeed DSL is available in three packages, offering the following functionality:

Infospeed DSL Monthly Rates	Speed of data downloaded from Internet or LAN	Speed of data uploaded from home or remote location
Infospeed DSL 640K \$39.95	640 Kbps	90 Kbps
Infospeed DSL 1.6M \$59.95	1.6 Mbps	90 Kbps
Infospeed DSL 7.1M \$109.95	7.1 Mbps	680Kbps

One Time Charges

One-time charges include the following:

Service Connection Charge:	\$99.00
DSL Modem:	\$325.00
Turnkey Home Installation:	\$99.00

The levels of Infospeed DSL service available to you will vary based on your distance from your Bell Atlantic Central Office. Infospeed DSL is not available in all areas.


[Homepage](#) [For Your Home](#) [For Your Business](#) [For Government](#) [About Us](#) [Privacy](#)

ATTACHMENT C



Bell Atlantic For Your Business

Infospeed DSL**Infospeed DSL
Homepage****What is
Infospeed DSL?****Availability****Pricing****Frequently
Asked Questions****Press Releases
and Links****Infospeed DSL for
Service Providers****Quick Find****Contact Us**

Infospeed DSL for Service Providers

Microsoft CEO Bill Gates' technology predictions ... are out: fast DSL (digital subscriber lines) connections ... will make a big splash ... DSL will take off ...

- Jeff Peline, NEWS.COM, 12/30/97

The Internet is growing - not only in users and people connecting, but also in data file sizes and downloadable information. Yesterday it was text. Today it is graphics. Tomorrow? The sky is the limit, not the bandwidth. Customers are demanding faster access and new applications. Bell Atlantic can help you leverage the bandwidth so you can provide your residential customer with megabits of information.

Where Do You Fit in?

Bell Atlantic is providing the transport, the basic high-speed access connection to the business and residence. That is what we do best. Here is where you fit in: Content, Internet Access and Services. That is what you do best. Customers need a place to go on the Internet to get their e-mail, set-up home pages, chat with a friend, check information, or just surf around. And, with the bandwidth of Infospeed Service, powered by DSL technology, the potential for new applications, by you, our partners, is tremendous!

Bell Atlantic is in the process of looking for partners for Internet Protocol (IP) connectivity. Bell Atlantic has the access and transport. We need you to provide the services and content. You have grown the Internet. Your network and content are key parts of the puzzle. We need your piece to make the picture complete. Help us make the customer's Internet experience a rewarding, educational, and entertaining one.

By partnering with Bell Atlantic in the offering of Infospeed DSL Service, you, as a Service Provider, content developer, or media company can offer more services and add greater value to your customers.

Currently Infospeed DSL is a point-to-point service, but ultimately access to multiple locations will be available. In order to support Infospeed DSL users you must have an ATM connection to the Bell Atlantic Network.

[The Bell Atlantic ISP/ADSL Care Package](#) [MS Word 95 document, 780 Kb]

For more information on the Service Provider Partner Program:

- [Service Provider Partner Program Overview Packet](#)
- Please contact your local Bell Atlantic Account Manager



[Homepage](#) [For Your Home](#) [For Your Business](#) [For Government](#) [About Us](#) [Privacy](#)

[Copyright](#) © 1999 Bell Atlantic Corporation



Bell Atlantic For Your Business

Infospeed DSL

Infospeed DSL
Homepage

What is
Infospeed DSL?

Availability

Pricing

Frequently
Asked Questions

Press Releases
and Links

Infospeed DSL for
Service Providers

Quick Find

Contact Us

Infospeed DSL for Service Providers Overview Packet

Customer Letter — This cover letter provides an overview of the materials an ISP ought to download and review in order to have a better understanding of the ISP Partnership Program and its benefits. [MS Word 95, 13 Kb]

The Internet Service Provider DSL Partnership Program & Certificate of Intent (to participate) — This certificate provides a complete overview of the program, along with the roles and responsibilities of both the ISP and Bell Atlantic. The final page of the document provides interested parties with a Certificate of Intent to sign, and fax back to the ISP Program Office. [MS PowerPoint 95, 785 Kb]

The Bell Atlantic ADSL Deployment Schedule — The most current, up-to-date version of the Bell Atlantic deployment plans. [MS Excel 95, 203 Kb]

The September 30, 1998 Press Release Announcing the ISP Partnership Program [MS Word 95, 167 Kb]

The Bell Atlantic ISP/ADSL Care Package — Service Overview [MS Word 95, 780 Kb]



[Homepage](#) [For Your Home](#) [For Your Business](#) [For Government](#) [About Us](#) [Privacy](#)

Copyright © 1999 Bell Atlantic Corporation

Volume

1

xDSL Services

ISP/SP Care Package for ADSL

~ ~ ~ ~ ~ xDSL Core Team

ADSL Information for the ISP

© Bell Atlantic Corporation
New York, NY

Table of Contents

Introduction to ADSL High Speed Data Service

By Jeff Peline, NEWS.COM, December 30, 1997

What is ADSL?

Bell Atlantic ADSL Service

What does Bell Atlantic ADSL Service offer the ISP?

Bell Atlantic ADSL End User Packages

What is Bell Atlantic ADSL Service?
IP Addressing
Service and Equipment
 A description of service and equipment requirements
End User Computer Configuration
What equipment does the customer need at home?
ADSL Subscriber Equipment Installation
What service and equipment does the Service Provider need?
ADSL Availability
 Deployment Plans for ADSL Commercial Service
 Washington, D.C. Areas:
 Pittsburgh Areas:
 Philadelphia Areas:
 New Jersey Areas:
Ordering ADSL Service
ATM Cell Relay ISP/SP Activation Process Flow
ISP/SP Service Order Requirements
Troubleshooting
Billing
Security Issues
Competitive Services
 How does ADSL compare to cable modems?
ADSL Future
 What is the future of ADSL Service?
ADN Technical Summary
 Configuration
 Security
 Performance

Section

1

Introduction to ADSL High Speed Data Service

Microsoft CEO Bill Gates's technology predictions for the new year are out: fast DSL connections... will make a big splash in 1998... DSL (digital subscriber lines) will take off...

By Jeff Peline, NEWS.COM, December 30, 1997

B

ell Atlantic has received many inquiries from ISPs, on-line providers and enhanced service providers regarding ADSL service. This document was designed to help answer your questions regarding Bell Atlantic ADSL service and the opportunities ADSL service may present to your business. This document should be considered a "living" document that will be expanded to encompass new information with future addendum. Some of the information is preliminary and therefore may change as the service comes closer to commercial deployment. Those sections subject to change will be noted.

What is ADSL?

ADSL is one of the most popular acronyms in telecommunications today. ADSL stands for Asymmetric Digital Subscriber Line. This technology provides high speed data access over a single pair of ordinary telephone wires utilizing the unused portion of the frequency spectrum in POTS (plain old telephone service). The service is termed asymmetric because the downstream speeds from the central office to the home are much greater than the upstream speeds, from the home to the central office (see Figure 1). For example, 1.5M bits/sec from the Internet to the user and 64K bits/sec from the user back to the Internet. Accordingly, it is perfect for Internet access where typically small packets are sent into the web in order to retrieve large amounts of information from the web.

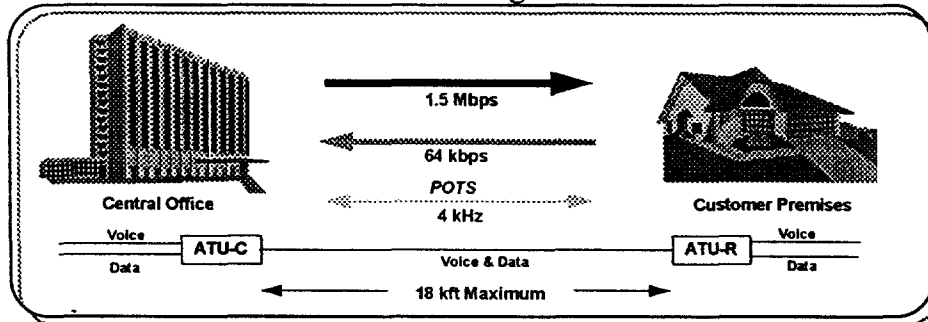


Figure 1 - This diagram illustrates the asymmetric nature of ADSL with the higher speed in the downstream direction to the subscriber and the lower speed in the upstream direction. The actual loop distance varies with the speeds provisioned. Bell Atlantic's ADSL service will be provisioned to subscribers within 8,000 to 12,000 feet from the local serving office.

Section

2

2

Bell Atlantic ADSL Service

What does Bell Atlantic ADSL Service offer the ISP?

A

DSL can increase the Internet experience and gain customer loyalty through a flat rated high speed Internet service. This can serve to minimize your churn and increase your subscriber base.

ADSL can allow you to compete effectively against high speed cable modems from cable providers and Multiple Systems Operators (MSOs). Just like cable modems, this is an "always-on" connection.

ADSL can expand your presence throughout a LATA and create a larger service footprint—without requiring access lines to/from individual points of presence (pops). ADSL is a way to minimize churn, retain subscribers and strengthen customer loyalty.

ADSL can differentiate your service from other service providers. Customers will perceive you as a leader being the first to offer a cutting edge technology. ADSL is a way to minimize network costs. You eliminate individual access line purchases with a fast packet connection, in addition to reducing remote access server costs. ADSL can minimize customer support costs. The equipment is easy to get up and running for a customer—it is plug and play. ADSL allows the customer to make voice or fax calls while simultaneously transmitting data. Voice does not impact the data service, and data does not impact the voice service.

Bell Atlantic ADSL End User Packages

Infospeed DSL Service is provided on a Plain Old Telephone Service (POTS). The monthly flat rate price is in addition to the monthly telephone line and does not include Internet Service. Bell Atlantic will charge a one-time connection fee of \$99 for the subscriber.

Bell Atlantic expects to come to the market with three ADSL packages. ADSL technology is distance sensitive, therefore the local loop length determines the maximum speed (e.g. bandwidth) of the ADSL service to the end user. Discounts may be available for volume purchases.

Product	Speed	Price	Loop Qualification
Infospeed 640k	640 Kbps Downstream 90 Kbps Upstream	\$39.95	12,000 ft.
Infospeed 1.6M	1.6 Mbps Downstream 90 Kbps Upstream	\$59.95	8,000 to 12,000 ft.
Infospeed 7.1M	7.1 Mbps Downstream 680 Kbps Upstream	\$109.95	8,000 ft.

The Loop Qualification column lists the functional distance from Bell Atlantic's Local Serving Offices to the subscriber's home. The two higher speed packages will be implemented in speed ranges due to the fact ADSL is distance sensitive. The rates customers' modems sync up at will vary, with the exception of the 640 Kbps speed. When Bell Atlantic sells the service, we will make sure the customer understands they actually are purchasing a "speed range". There will be a minimum speed associated with the two higher speeds.

What is Bell Atlantic ADSL Service?

Bell Atlantic ADSL Service is designed for consumer high speed Internet Access and Remote LAN Access. ADSL Service will initially be deployed as a "best effort" service. There is no guarantee of data throughput. In the future, Bell Atlantic intends to expand its service offering to include various quality of service parameters. However, Bell Atlantic will not be offering that option at service introduction.

ADSL technology is distance sensitive. Therefore, the local loop length determines the maximum speed (e.g. bandwidth) of the ADSL Service to the end user. In addition, telephone facilities and environmental conditions can affect ADSL performance. Bell Atlantic will use Rate Adaptive technology which allows the ADSL equipment to find an acceptable line speed to operate within these conditions (down to 640Kbps downstream/90Kbps upstream). This ensures that a customer's ADSL Service will not simply stop working due to unforeseen changes in line conditions.

Bell Atlantic's ADSL Service initially provides a bridged ethernet over ATM connection, which will support multiple protocols. However, to maximize the efficiency of the ADSL

Data Network, we are restricting the use to Internet Protocol (IP). Since the network is bridged Ethernet, IP addressing is the responsibility of the Service Provider. Both, Static IP address assignment and dynamic assignment via Dynamic Host Configuration Protocol (DHCP) connectivity can be supported. Future enhancements to the service will focus on IP layer services, such as Point-to-Point Protocol (PPP) and Layer 2 Tunneling Protocol (L2TP).

The Bell Atlantic ADSL architecture provides for the ADSL modem in the consumer home to encapsulate Ethernet frames into ATM AAL5 cells, and transport these cells over the ADSL loop to the central office. Therefore, the Bell Atlantic central office will be receiving ATM traffic from the home for more efficient transport over our ATM/Cell Relay infrastructure. The ATM Quality of Service (QoS) associated with the ATU-R will be Unspecified Bit Rate (UBR.), otherwise known as, "Best Effort" service.

One of the integral parts of the Bell Atlantic ADSL architecture is a Gateway Router. Initially, there will be one or more Gateway Routers per LATA. The Gateway Router will aggregate end user's data traffic and pass it to the appropriate Service Provider's connection. The ISP/SP connection will be an ATM Permanent Virtual Connection (PVC) provisioned over our public ATM/Cell Relay Service. This allows the ISP/SP to purchase ATM/Cell Relay Service to serve an entire LATA, thereby increasing its customer footprint without requiring additional access lines or Points of Presence (POPs).

IP Addressing

Initially, Bell Atlantic ADSL network architecture allows for two types of IP address schemes—static IP assignments or DHCP. Both types of IP address schemes will be provided by the Service Providers, not Bell Atlantic. Also, the residential customer will only be able to go to a single destination, e.g. one Service Provider or corporate LAN. Bell Atlantic plans to implement PPP over ATM in the future to allow connections to multiple destinations.

PPP connectivity will allow the ISP/SP to utilize current authentication, authorization, and accounting systems, e.g. RADIUS. PPP will also allow customers to connect to multiple destinations from a single ADSL line. Looking further out on the planning horizon, the ability to reach multiple destinations concurrently via a single ADSL line (from one or more PCs) will likewise be supported. This capability will require multiple PVCs to each customer and Domain Name Routing to support multiple users and concurrent PPP sessions to different locations. For example, a customer can be connected to their corporate enterprise router, as well as surfing the Internet through the ISP.

Section

3

2

Service and Equipment

A description of service and equipment requirements

T

his chapter provides a description of service and equipment requirements for the ISP/SP and for the residential customer to connect into Bell Atlantic ADSL service. As ADSL matures, the equipment requirements may change.

End User Computer Configuration

The ADSL Service subscribers will require a compatible computer equipped with a network interface card and communications software. It is recommended that subscribers use a computer with a processor capable of running Microsoft Windows 95, Windows 98 or Windows NT. Macintosh computers have not been tested with our ADSL Service.

However, any computer that is equipped with an Ethernet Network Interface Card (NIC) and supports TCP/IP communications protocol stack could be compatible with ADSL Service.

In addition to configuring the Ethernet network card, the TCP/IP communications protocol must be programmed for either a static or dynamic IP address. The Internet Service Provider or Corporate Data Center is required to provide each end user with a unique, registered IP address. The method to assign this IP address can vary by Service Provider. Typically, the IP address is programmed in the computer's network configuration. This is known as a Static IP Address assignment. The other method is dynamic IP address assignment via a Dynamic Host Configuration Protocol (DHCP) server. Again, the Service Provider is responsible for the method selected, the assignment and management of the IP addresses provided to the ADSL Service subscribers. Furthermore, ADSL Service subscribers should disable any peering or remote user access to their computer as a security precaution. ADSL Service is designed to support only Internet Protocol in compliance with standards established by the Internet Activity Board as stated in the following publications: RFC 2300, Internet Official Protocol Standards; J Postel, Editor, issued May 1998.

What equipment does the customer need at home?

The ADSL Service subscriber (end user) will require the installation of a POTS splitter, inside wiring, a compatible ADSL modem, also known as ADSL Terminal Unit-Remote (ATU-R) and an Ethernet Network Interface Card (NIC) for their Personal Computer (PC). The Westell CAP Rate Adaptive ADSL Remote Unit (A90-36CP21R-W00) is the only tested and approved ATU-R available for use with Bell Atlantic's ADSL Service. The POTS splitter is installed in the NID (network interface device), which is the telephone company demarcation point at the home (see Figure 2). The POTS splitter serves to separate the lower portion of the frequency spectrum for voice, and the higher portion of the frequency spectrum for data. New inside wiring is recommended to connect the splitter to the ATU-R. The customer may then plug their computer in to the ATU-R via an RJ45, 10-Base-T, Ethernet cable. Bell Atlantic recommends the installation of new wire from the POTS splitter to the ATU-R because of potential interference from telephone extensions in the home. The ATU-R does not require any end user configuration. All software parameters are automatically downloaded from the ATU-C (ADSL Terminal Unit-Central Office) located in the central office at time of installation. This serves to make the unit plug and play. If the unit should malfunction, or electricity go out in the home, the customer will still be able to make or receive voice calls over their regular analog telephone set.

The Bell Atlantic central office in Figure 2, depicts the subscriber's data traveling between the ATU-R and ATU-C. These units are one for one mated pairs and the bandwidth is not shared like cable modems. The POTS splitter takes the voice and delivers it to the voice switch, while the data is transmitted to the Bell Atlantic data overlay network. Note that this design means the data traffic never hits the voice switch, unlike POTS modems or ISDN circuit switched data calls. The voice network was originally engineered for three minute hold times, not for computers logged into the Internet for hours at a time, tying up voice ports and creating an "Internet Busy Signal" at the central office. The data traffic stays on the "data dial tone" network, while the voice traffic stays on the voice side of the

shop.

The ADSL Data Network extends from the subscriber's premises to the ISP/SP's PVC in the public ATM network.

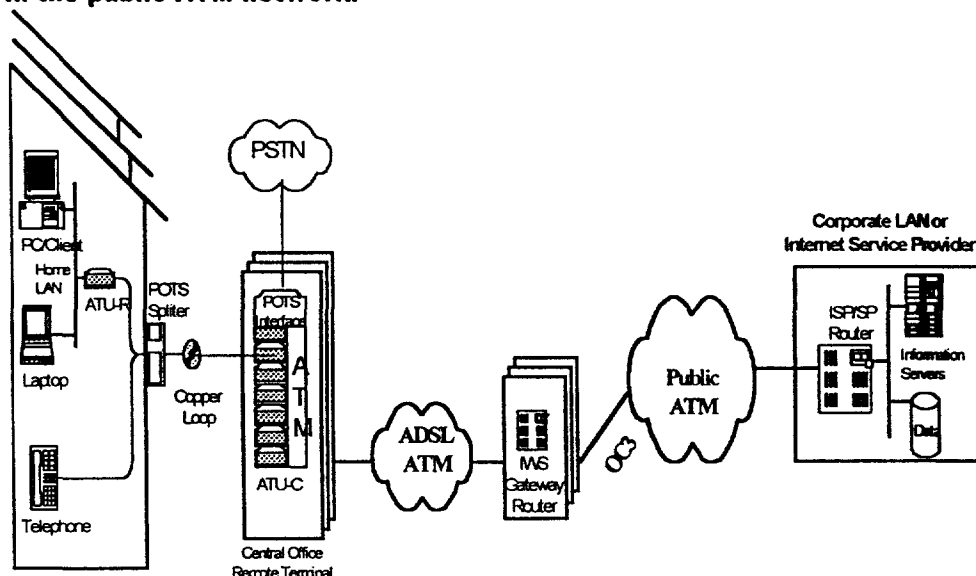


Figure 2 - This

figure depicts the components required at the residence and connections into the central office and ISP/SP. The POTS splitter is installed in the Network Interface Device, which is the Rate Demarcation Point (RDP) for Bell Atlantic.

ADSL Subscriber Equipment Installation

Bell Atlantic can install the POTS splitter, ATU-R, Ethernet NIC, and any inside wiring. Our service technicians can install the POTS splitter with the installation of the ADSL Service. Additional inside wiring, ATU-R or Ethernet NIC installation can be performed by our subsidiary, Bell Atlantic Communications and Construction Services, Inc.

(BACCSI). The customer may also choose to perform their own installation.

Bell Atlantic anticipates the ATU-R retail cost to be about \$325 a unit. This unit is a Westell ATU-R and may be purchased by the customer through Bell Atlantic. If the ISP/SP would like to sell the Westell ATU-R to the customer itself, the ISP/SP may negotiate volume purchases with Bell Atlantic. Currently, there are no other manufacturer ATU-R units in the market that are interoperable with Bell Atlantic's ADSL Service. As standards evolve, Bell Atlantic plans to migrate to a standards-based ADSL platform that encompasses interoperability with multiple ATU-R vendors. However, the initial deployment is with Westell ATU-R, ADSL modems.

What service and equipment does the Service Provider need?

The ISP/SP needs to purchase an Asynchronous Transfer Mode (ATM) Fast Packet Service User Network Interface (UNI) connection. Additionally, a Permanent Virtual Connection (PVC) must be configured from the ISP/SP UNI to the ADSL Gateway Router in each LATA the ISP/SP desires to service. Therefore, the ISP/SP must have a router or equivalent that supports an ATM UNI 3.0 or 3.1 interface for the connection. The ISP/SP can start with a smaller ATM connection such as a DS1, 1.5M bits/sec and upgrade to larger connection like a DS3, 45M bits/sec or OC3, 155M bits/sec, UNI in the future as requirements grow.

The end user ADSL traffic is forwarded to the Gateway Router in the form of ATM cells. This router collects the ATM PVCs, then maps them to the ISP/SP Virtual LANs (VLAN) defined in the Gateway Routers which connects to Bell Atlantic's public ATM/Cell Relay Service. Each VLAN requires one PVC to the ISP/SP's ATM UNI. Each Gateway router will terminate up to three (3) OC3 channels to terminate end users' PVCs. The Gateway router aggregates these PVCs and maps them to the appropriate ISP/SP VLAN. Three VLANs and associated PVCs may be required to connect to the ISP/SP's ATM UNI. The need to establish multiple VLANs is to maintain a basic level of security preventing end users from sending and receiving unsolicited data packets. Existing tariff rates apply to all Bell Atlantic's Fast Packet Services. The Gateway Router connections are designed to support Consumer Internet Access with a "Best Effort" class of service. The ATM CPE used by the ISP/SP must support traffic shaping for VBR class of service and bridged Ethernet packets encapsulated in ATM cells via the RFC 1483 specification. Also, it is recommended that the ISP/SPs implement a level of Network Ingress Filtering as per RFC 2267. RFC 2267 addresses defeating denial of service attacks which employ IP source address spoofing.

Section

4

2

ADSL Availability

Deployment Plans for ADSL Commercial Service

T

he commercial launch of Bell Atlantic ADSL service is slated for mid September, with availability from selected central offices. Bell Atlantic plans to service 2 million lines in 1998 and an additional 5 million lines in 1999. Deployment of the new suite of Bell Atlantic Infospeed services will begin in September in the Washington, D.C., Pittsburgh, and Philadelphia metropolitan areas. New Jersey's Hudson River waterfront will follow in October. The New York City and Boston metropolitan areas will begin to come on-line early in 1999. Additional markets will be announced in the future. Specific roll-out locations within each area currently planned in 1998 are:

Washington, D.C. Areas:

VA - Arlington, Falls Church, Alexandria, Merrifield, Annandale, Franconia, Vienna (plus, current trial locations McLean/Tysons, Lewinsville, Fairfax, Springfield, and Burke).

MD - Bethesda, Silver Spring, Wheaton, Potomac, Rockville, Beltsville.

D.C. - Woodley Park, Georgetown, and Dupont Circle.

Pittsburgh Areas:

Squirrel Hill, Glenshaw, Oakland, Beaver Falls, Bethel Park, Carnegie, Connellsville, Greensburg, New Castle, New Kensington, Uniontown, Washington.

Philadelphia Areas:

Bala Cynwyd, Ardmore, Bryn Mawr, Phoenixville, Coatesville, Downtown, Chestnut Hill,

Downingtown, Willow Grove, Jenkintown, Perkasi, and Royersford..

New Jersey Areas:

North Bergen, Bergen, Englewood, Leonia, Hoboken, Jersey City, Cliffside Park, Union City, Hackensack, Rutherford, Oradell, Elizabeth, and parts of Newark.

The home must be within 8,000 to 12,000 feet of its Local Serving Office to qualify for the various ADSL service offerings. Bell Atlantic anticipates between 40 to 60 percent of homes in a given geographic area will be able to get the service. This percentage will vary depending on the different outside plant conditions at each central office location. The reach will increase even further as ADSL technology advances. Bell Atlantic believes the technology ultimately will be able to reach 80 percent of the homes we service today.

An ISP/SP will be able to check ADSL availability in an area by secure Internet access to the Bell Atlantic loop qualification database, which is planned to be a web-based GUI. The ISP/SP can type in an address or telephone number and check to see the ADSL speed rates the potential subscriber is qualified to receive. Bell Atlantic plans to issue a service provider code, administrative username and password for the ISP/SP to use to access the database. The ISP/SP will also be able to set up more users if the ISP/SP desires a different username for each employee accessing the database. Bell Atlantic anticipates issuing regular updates of the ADSL capable central offices within the region, thereby helping the ISP/SP to plan its marketing strategy to build business.

Ordering ADSL Service

Bell Atlantic anticipates that a customer will have two methods to order ADSL service with connectivity to a Service Provider. Bell Atlantic will transparently connect the customer to the fast packet service subscribed to by the ISP/SP in all methods.

In the first method, the residential customer calls either Bell Atlantic InfoSpeed or the Bell Atlantic Residential Service Center (RSC) and asks for ADSL Service. If the RSC was contacted, they will transfer the customer to the Bell Atlantic InfoSpeed office. InfoSpeed personnel are trained in consumer high speed data services. InfoSpeed will gather the necessary information and will be able to sell the customer CPE and installation services. InfoSpeed will then instruct the customer to call the ISP/SP of choice that is connected to the ADSL Data Network.

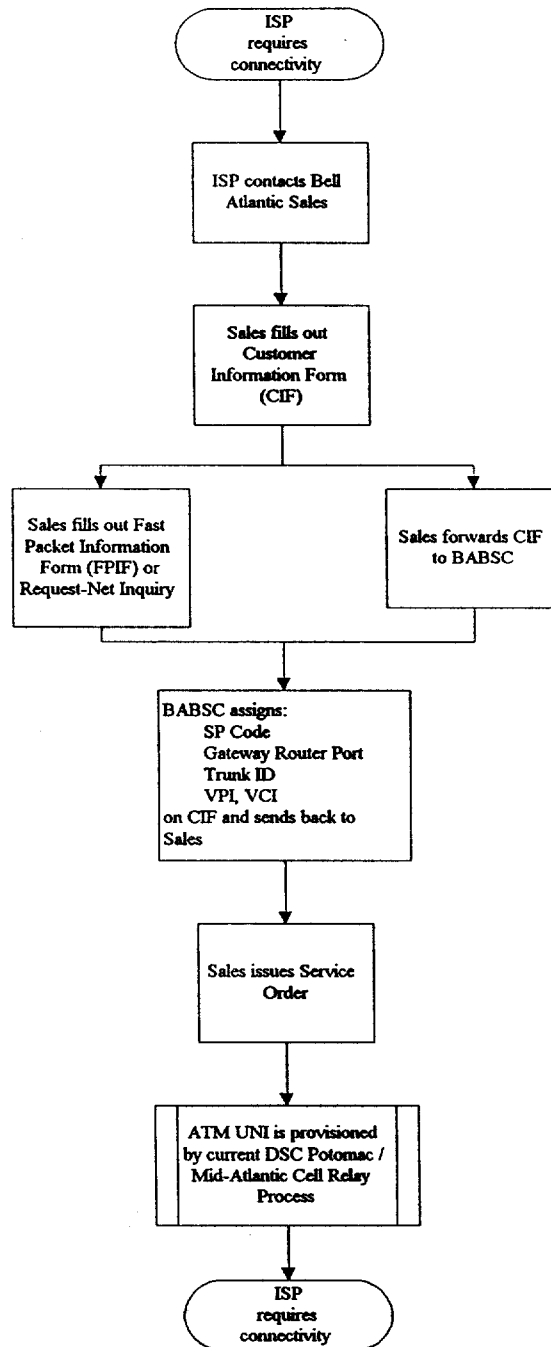
In the second method, the customer will directly contact the ISP/SP for Bell Atlantic's ADSL service. The ISP/SP will gather the customer information and then perform either a "warm" transfer of the customer to the Bell Atlantic InfoSpeed center or forward the necessary information electronically to the InfoSpeed center. InfoSpeed personnel will then gather the appropriate customer information required to provision an ADSL connection. The customer can order the CPE and installation services from InfoSpeed or directly from the Service Provider.

The Service Provider will order a public ATM/Cell Relay Service connection for each LATA they intend to support ADSL Service. This is done through their Bell Atlantic account team. The account team will secure an Service Provider (SP) code to be used to associate ADSL Service subscriber to the appropriate ISP/SP. ADSL Service is provisioned as a LATA-wide service and ISP/SPs will be required to purchase access, on a per LATA basis, to support their ADN applications.

The ISP/SPs can purchase ADSL Service for their customers and bundle it with Internet Services. Alternatively, the Service Providers' customers can purchase the ADSL Service

directly from Bell Atlantic and association will be made using the appropriate SP code.

ATM Cell Relay ISP/SP Activation Process Flow



ISP/SP Service Order Requirement:

Orders for ADSL Service but will be written in the local service order system. Below is an example of a local Service Order for a new UNI, with one PVC to the Gateway router.

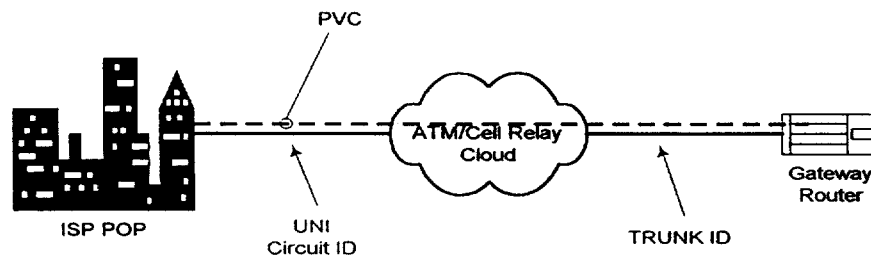
ATM UNI (physical facility) DS-1 (1.5 Mbps) DS-3 (45 Mbps) OC-3c (155 Mbps)

Written under the current "on line" ATM M&P's for local service.

PVC (local logical connectivity) ISP/SP local PVC information Circuit ID VPI, VCI

QOS (CBR or VBRnrt)

PVC (Far-end logical connectivity) Gateway Router PVC information Remote Trunk ID RVPI, RVCI



Troubleshooting

Bell Atlantic's Infospeed Center currently maintains a help desk that is staffed Monday through Friday 8am to 8pm. Bell Atlantic's Infospeed Center is planning on extending its operations hours to have technical support available 24 hours a day, seven days a week. Bell Atlantic's Infospeed Center coordinates troubleshooting responsibilities for inside wire, ATU-R, POTS splitter and Personal Computer setup and software. The Infospeed Center coordinates troubleshooting with the Bell Atlantic Broadband Service Center (BABSC). The BABSC will only be contacted if it is believed that there is a network problem. When the ISP cannot determine the area of a network problem a call to the BABSC will be initiated to help assist trouble isolation, sectionalization and repair. If the ISP chooses to purchase the ADSL, and is therefore the customer of record the ISP will need to perform the initial troubleshooting with the customer before calling Bell Atlantic (BABSC). This includes inside wire, ATU-R, POTS splitter, PC hardware and software. The ISP will be responsible to call the trouble to Bell Atlantic (BABSC). Repair calls for the ISP fast Packet service should be reported to the normal Data Services Center. Your Bell Atlantic ISP sales account team can provide further information on fast packet repair process.

Billing

Bell Atlantic has two methods of billing customers. Customers may receive ADSL charges as a line item on their existing Bell Atlantic monthly statement. This would be a service charge above their normal POTS line. Also, a corporate client or Service Provider may choose to be billed for the ADSL Service subscribers on a summary bill.

Security Issues

Although Bell Atlantic believes ADSL service to be extremely secure, Bell Atlantic recognizes that precautions can help defeat potential security threats posed by a public network such as the Internet.

- Bell Atlantic recommends that customers disable file and print sharing on Windows 95 operating systems.

- Additionally, the ISP or company that purchases the fast packet connection to the Gateway Router has security issue responsibilities on its side of the network.

Section

5

2

Competitive Services

How does ADSL compare to cable modems?

ADSL Service Cable Modems

Up to 7 Mbps downstream, 680 Kbps upstream in a point to point connection. Bandwidth is dedicated, not shared, between the user's home and central office. Up to 30 Mbps downstream, engineered for sharing between 500-2,000 users. Service deterioration will happen if a large number of users attempt simultaneous transmission.

ADSL is not subject to eavesdropping in a point-to-point environment. Also, Copper passes the entire customer base. Cable is a shared medium that is subject to eavesdropping and service theft.

ADSL is scaleable to any copper-based customer. An access node can be installed into an area when economically justified. Subscription can be made only after the *entire* network is upgraded to HFC.

ADSL provides for simultaneous voice service on the POTS line. Current cable modems do not provide for voice and require an analog modem for upstream communications which ties up a dial tone line.

ADSL modems only affect a single user if malfunctioning. A CATV line cut will bring down all users on that line.

Bell Atlantic ADSL modems will be interoperable across the region. Cable modems are often not interoperable.

Bell Atlantic plans to offer the service with a choice of ISPs and/or corporate enterprise network for Remote LAN applications. Cable customers currently are typically limited to a single service provider-the cable company itself.

Section

6

2

ADSL Future

What is the future of ADSL Service?

T

he current maximum loop qualification for ADSL service over twisted pair wire is 12,000 feet. Bell Atlantic understands a significant portion of the total user population resides further than 12,000 feet from a central office. In order to penetrate this market space, Bell Atlantic ADSL architecture will evolve to support ADSL in a next generation digital loop carrier system in the remote terminal (RT) environment. This architecture supports ATU-C cards that are plugged into DSC Litespan equipment placed in a RT. The RT is within 12,000 feet from a residential neighborhood. An OC-3 fiber connection carries the ATM over ADSL data from the residence back to the central office. The ADSL RT platform is expected to be commercially deployed in 1999.

Bell Atlantic is working with ADSL vendors to develop an ATU-R with a USB interface. The USB interface will allow customers to plug into an ADSL modem without the need to open the PC and install a NIC card.

Bell Atlantic is an active member of the UAWG (Universal ADSL Working Group). The UAWG is a consortium consisting of Bell Atlantic, Compaq, Intel, Microsoft, other RBOCs, and many xDSL equipment vendors. The goal of the UAWG is to speed deployment of high speed Internet access through a universal, single standard. This should bring equipment prices down and make installations a fairly simple process. The UAWG technology will be splitterless, that is, no POTS splitter will be required at the residence. Splitterless technology is designed to eliminate a telephone company truck roll

and thereby lower installation costs and reduce installation intervals. Bell Atlantic is also exploring other xDSL alternatives to ADSL. This includes IDSL, SDSL, HDSL, and VDSL technology. Bell Atlantic will notify ISPs of availability of these services in the future, if and when they become commercially viable to deploy.

Section

7

2

ADN Technical Summary

T

his Technical Summary is intended to provide Service Providers with implementation specific information regarding Bell Atlantic's ADSL Data Network (ADN). It is expected that this information will assist Service Providers in designing their networks to interconnect with ADN. In this summary, Bell Atlantic also makes some technical recommendations that SP should follow to ensure that their customers are delivered the maximum performance achievable with ADN. This summary provides information in the areas of configuration, security, and performance. These topics are discussed using the reference architecture shown in Figure 3.

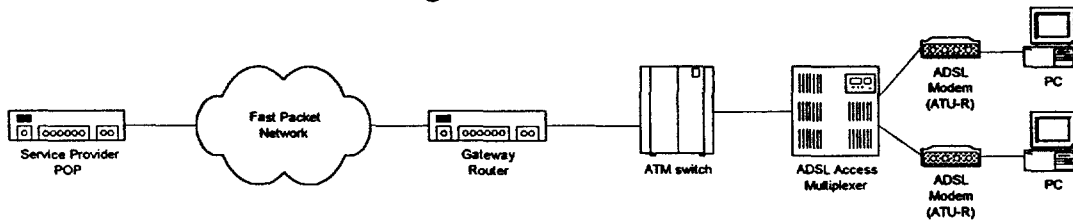


Figure 3: ADSL Data Network Reference Architecture.

Configuration

Bell Atlantic uses a gateway router to perform traffic aggregation for the Service Provider. An ATM PVC is provisioned from each ADSL Terminating Unit -Remote (ATU-R) to the gateway router. Ethernet frames generated from the subscriber's PC are RFC 1483 LLC/SNAP encapsulated and carried over the ATM PVC. Upon arrival at the gateway router, the Ethernet frame is recovered and bridged to the Fast Packet Connection serving the Service Provider. At this point, the gateway router performs an RFC 1483 LLC/SNAP encapsulation for bridged Ethernet/IEEE 802.3 frames to carry the Ethernet frame over the ATM Cell Relay network. ***The Service Provider must ensure that the equipment used to connect with the Cell Relay connection for ADN supports bridging of Ethernet frames.***

Furthermore, it is required that the Service Provider performs traffic shaping into the Cell Relay connection. This follows since the initial switch in the Bell Atlantic Fast Packet Network will police the Service Provider's traffic to ensure that it conforms to the ATM Cell Relay connection's traffic descriptors that were negotiated when the Fast Packet connection was purchased. Nonconforming traffic will be dropped with the expectation that the higher layer protocols will recover and trigger a retransmission of the lost data. The traffic that Bell Atlantic delivers to the Service Provider will not be shaped on egress from the gateway router into the Fast Packet connection. This means that the Service Provider must not assume that traffic received from ADN via a Fast Packet connection conforms to the traffic descriptors associated with that connection.

In Figure 3, the gateway router uses a Virtual LAN implementation to support the proper bridging of traffic to and from a Service Provider. A VLAN is a software capability which allows the creation of virtual Ethernet LANs by logically grouping separate sets of

physical and logical interfaces in the gateway router. One VLAN is equivalent to one Ethernet LAN (or in general terms one layer-2 broadcast domain). Thus, the use of VLANs allows Bell Atlantic to ensure that one Service Provider's traffic can never be bridged to another Service Provider's customers and vice versa. As a result of the specific VLAN implementation used, in certain LATAs, a Service Provider may be configured with multiple VLANs at the gateway router. For these cases, the Service Provider must use multiple Fast Packet Connections to the Gateway router, i.e., one per VLAN, to ensure the security of the Service Provider's customers. More details on this security ramification will be provided in the next section.

All user authentication is at the discretion of the Service Provider. Bell Atlantic performs no user authentication in ADN. Furthermore, IP address assignment is also the responsibility of the Service Provider. Three approaches can be used: 1) the Service Provider can assign static IP addresses to its customers, 2) the Service Provider can implement the Dynamic Host Configuration Protocol (DHCP), or 3) the Service Provider can implement their own proprietary scheme for address assignment.

ADSL Service is designed to support only Internet Protocol in compliance with standards established by the Internet Activity Board as stated in the following publications: RFC 2300, Internet Official Protocol Standards; J Postel, Editor, issued May 1998.

Security

Bell Atlantic will provision the gateway router such that a VLAN is always associated with a single Service Provider. A VLAN defines to whom traffic can be bridged. Therefore, the gateway router ensures that traffic received from the Service Provider's customer can only be bridged to that Service Provider. The gateway router implementation goes further by also preventing one customer's traffic from being bridged directly to another customer on the same VLAN without traversing the Service Provider's network. This applies to both unicast Ethernet frames as well as broadcast Ethernet frames. It must be emphasized, however, that if the Service Provider sends a broadcast Ethernet frame to the gateway router, the frame will be sent to all customers on the VLAN.

The gateway router deployed in ADN uses a content addressable memory (CAM) table to store the MAC addresses reachable via a given ATM PVC. The gateway router learns the PVC to MAC address associations by watching the Ethernet traffic traversing it. If a period of times passes in which no traffic from a given customer traverses the gateway router, the CAM table entry associated with that customer will be purged. If this occurs and an Ethernet frame is sent from the Service Provider to the customer, the gateway router now has no way to determine how to bridge the frame to the correct ATM PVC. Therefore, the gateway router will transmit the Ethernet frame on all ATM PVCs comprising the VLAN. As soon as the customer generates more Ethernet traffic, the gateway router will relearn the ATM PVC to MAC address association and reestablish an entry in the CAM table. To help prevent the situation where a unicast Ethernet frame is transmitted to all customers in the VLAN, Bell Atlantic has set the CAM table timeout value to 5 minutes. Bell Atlantic is willing to explore increasing this timeout value if any Service Provider believes that the current setting is inadequate.

Bell Atlantic recommends that the Service Provider continue to implement any software that is currently used to impede denial of service attacks. This will help ensure that the ADN does not suffer service disruptions or degradation from these types of attacks. Finally, Bell Atlantic recommends that the Service Provider advise its customers to

disable both the print sharing and file sharing features on their PCs running Windows. This will help prevent security attacks originating on the Internet from affecting a customer.

Performance

Bell Atlantic will provision at most 500 ATM PVCs from the Service Provider's customers to a given VLAN. Since each VLAN requires a separate Fast Packet Connection, *it is recommended that the Service Provider dimension their Fast Packet Network connections based on a worst case traffic assumption of 500 ADSL connections being aggregated onto a Fast Packet connection.* It is at the Service Provider's discretion the extent to which the statistical multiplexing gain is factored into determining how much bandwidth to purchase for a given Fast Packet connection to ADN.

As previously discussed, when a Service Provider sends an Ethernet broadcast to the gateway, the broadcast is delivered to all customers on the VLAN. The gateway router will exhibit performance degradation if large number of broadcast are sent back-to-back to the gateway router. This is due to the copying function that must be performed by the gateway router. *Therefore, it is highly recommended that Service Providers limit the amount of Ethernet broadcasts sent to the ADN.* Some approaches to doing this include disabling RIP towards the ADN and ensuring that the Service Provider's ARP cache has a sufficient timeout. Bell Atlantic can assist the Service Provider in tuning their ARP cache timeout parameter if necessary. If the Service Provider is combining multiple Fast Packet Connections into a single VLAN in their equipment, the use of Ethernet broadcast has even more drastic consequences as now multiple VLANs will experience performance degradation if large numbers of back-to-back Ethernet broadcasts are sent.

FEDERAL COMMUNICATIONS COMMISSION

DOCUMENT INDEX TERMS

RECEIVED

APR 27 1999

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

1. Docket Number (7) CC Docket No. 98-147
2. Rulemaking Number (6)
3. Date of filed document (mm/dd/yy) (8) 04/27/99
4. Name of Applicant/Petitioner (last, first, mi) (25) Telecommunications Resellers Association
5. Law Firm Name (25) Hunter Communications Law Group, P.C.
6. Attorney/Author Name (last, first, mi) (25) HUNTER, Charles C.
7. File Number (20)

FOR FCC USE ONLY

8. Document Type (2) ☐ ☐
9. FCC/DA Number (10) ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
10. Release/Denied Date (mm/dd/yy) (8) ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
11. Receipt/Adopted/Issued Date (mm/dd/yy) (8) ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
12. Viewing Status (1) ☐
13. Ex Parte/Late Filed (1) ☐